

ORIGINAL  
RECEIVED

JUN - 2 1993

ELIZABETH J. WILSON  
OFFICE SECRETARY

Mitchell Lazarus  
Tel: 202/857-6466  
Fax: 202/857-6395

June 2, 1993

Ms. Donna R. Searcy  
Secretary  
Federal Communications Commission  
Room 222, Stop Code 1170  
1919 M Street, N.W.  
Washington, D.C. 20554

DOCKET FILE COPY ORIGINAL

Re: Petition for Rule Making -- Amendment of Parts 15 and 90 of the  
Commission's Rules and Regulations To Establish a Low Power  
Radio Service For Disability Services and Education and Health  
Care in the 216-217 MHz Band

Dear Ms. Searcy:

On behalf of Phonic Ear, Inc. and pursuant to Section 1.401 of the  
Commission's Rules, I enclose for filing with the Commission the original  
and nine copies of the above-referenced Petition for Rule Making.

The attached verification has been signed by facsimile. I expect to file the  
signed original of the verification within the next few days.

If you have any questions about this filing, please call me at the number  
above.

Respectfully submitted,

  
Mitchell Lazarus

No. of Copies rec'd \_\_\_\_\_  
List A B C D E C&T

ORIGINAL  
RECEIVED

JUN - 2 1993

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington DC 20554

In the Matter of )  
 )  
Amendment of Parts 15 and 90 of the )  
Commission's Rules and Regulations To )  
Establish a Low Power Radio Service )  
For Disability Services and Education )  
and Health Care in the 216-217 MHz Band )

RM- \_\_\_\_\_

To: The Commission (Mail Stop 1170)

DOCKET FILE COPY ORIGINAL

**PETITION FOR RULE MAKING**

Phonic Ear, Inc.  
3880 Cypress Drive  
Petaluma, CA 95954-7600  
Tel. 707-769-1110

Peter Tannenwald  
Mitchell Lazarus  
Arent, Fox, Kintner,  
Plotkin & Kahn  
1050 Connecticut Ave., N.W.  
Washington, DC 20036-5339  
(202) 857-6024/6466

Counsel for Phonic Ear, Inc.

June 2, 1993

## TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION . . . . .	1
II. AUDITORY ASSISTANCE DEVICES: A CASE STUDY . . . . .	5
III. AVAILABILITY OF SPECTRUM WILL PROMOTE ADDITIONAL USES OF LOW-POWER RADIO COMMUNICATIONS TO ASSIST PERSONS WITH DISABILITIES . . . . .	10
IV. THE 216-217 MHz BAND IS WELL SUITED TO DISABILITY SERVICE DEVICES . . . . .	14
V. REGULATORY ISSUES	
Eligibility . . . . .	16
Permitted Communications . . . . .	17
Frequencies . . . . .	18
Licensing and Power Limits . . . . .	19
Station Identification . . . . .	20
Emissions . . . . .	20
CONCLUSION . . . . .	21
<u>APPENDIX A</u> - Statutory Definition of "Public Accommodation"	

## SUMMARY

Phonic Ear, Inc. ("Phonic Ear") hereby petitions the Commission to establish a low power radio service in the 216-217 MHz band for services and education for disabled persons and for health care.

The Americans With Disabilities Act of 1990 ("ADA") requires operators of many privately owned facilities open to the public, such as theaters, stadiums, auditoriums, to install "auxiliary aids and services" to make aural material available to the hard-of-hearing, and also to make visual material available to those with visual disabilities. Auditory assistance devices at 72-76 MHz are already helping many facilities to fulfill this requirement, in addition to their long-standing role in educating hard-of-hearing children. Also, "descriptive audio," which uses similar technology to deliver aural descriptions of visual events, is used at some stage plays. At many locations, however, the presence of high-power licensed transmitters at 72-76 MHz does not leave enough channels available to meet even present auditory assistance needs. Further demands on the spectrum will come from increased use of these and other radio applications capable of assisting people with disabilities, such as descriptive audio sound tracks on movies and TV programs, input/output links between desktop computers and wheelchair-mounted hardware, and audio delivery devices to aid children with auditory attention problems.

The 216-217 MHz band is presently vacant, largely out of concerns of interference to adjacent TV channel 13. Phonic Ear

requests that the Commission allot this band to services for education of disabled persons and for health care, and that it restrict operation to low power transmitters -- not only to protect channel 13 and avoid the blanketing interference that plagues the 72-76 MHz band, but also to promote spectrum efficiency by permitting extensive frequency re-use, even at the same site. This band is ideal for the applications described because the short wavelength permits the manufacture of small, inconspicuous receivers. Moreover, there are no domestic high-power incumbents that would have to be relocated.

Phonic Ear proposes that eligibility for this band include people with disabilities and the facilities that serve them, along with public accommodations generally and health care facilities. Individual channels would be allocated, but users could split channels as needed. Transmitters operating at or below the Part 15 limits would be regulated under Part 15, while transmitters operating above those levels, up to and including 100 mW, would be licensed under Part 90. Operation above 100 mW would be prohibited.

Phonic Ear believes that adoption of these proposals will facilitate compliance with the ADA, improve educational opportunities for disabled students, and -- most important -- help disabled persons to attain the dignity that comes with full acceptance, participation, and respect in society.

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington DC 20554

RECEIVED

JUN - 2 1993

In the Matter of )

)  
**Amendment of Parts 15 and 90 of the** )  
**Commission's Rules and Regulations To** )  
**Establish a Low Power Radio Service** )  
**For Disability Services and Education** )  
**and Health Care in the 216-217 MHz Band** )

RM- \_\_\_\_\_

To: The Commission (Mail Stop 1170)

**PETITION FOR RULE MAKING**

1. Pursuant to Section 1.401 of the Commission's Rules, Phonic Ear, Inc. ("Phonic Ear") hereby petitions the Commission to amend its Rules to establish a low power radio service in the 216-217 MHz band for services and education for disabled persons and for health care. Adoption of this proposal will meet important needs of a population segment that Congress has explicitly determined to assist, will facilitate compliance by places of public accommodation with their statutory obligations under the Americans With Disabilities Act, and will put to highly productive use a spectrum segment which has previously lain fallow, without causing interference to reception of adjacent-channel television broadcast stations.

**I. INTRODUCTION**

2. Phonic Ear is the nation's leading manufacturer of wireless auditory assistance devices: low-power radio devices used to assist both hard-of-hearing children in school and hard-of-hearing adults (and children) in public gathering places such

as theaters, auditoriums, and houses of worship.<sup>1/</sup> Similar equipment is used to deliver aural descriptions of visual events, sometimes called "descriptive audio," to theater patrons who lack full sight. These are two examples of "disability services" using low-power radio that help people with disabilities to lead normal lives. Other instances are discussed in Part III, below.

3. The Americans With Disabilities Act of 1990 ("ADA") requires certain accommodations for the benefit of people with disabilities. In the case of hard-of-hearing people, for example, the ADA statutorily requires operators of certain privately-owned public facilities -- motion picture houses, theaters, concert halls, stadiums, auditoriums, convention centers, lecture halls, and other public gathering places -- to install "auxiliary aids and services," which are defined to include "effective methods of making aurally delivered materials available to individuals with hearing impairments."<sup>2/</sup> In a parallel provision, the definition of auxiliary aids and services

---

<sup>1/</sup> Phonic Ear (then called HC Electronics, Inc.) was the petitioner in the rule making that led to the adoption of rules in 1972 that specifically provide for auditory assistance devices. Auditory Training Devices For the Partially Deaf, 35 F.C.C.2d 677 (1972).

<sup>2/</sup> 42 U.S.C. §§ 12102(1)(A), 12181(7)(C), (D), 12182(b)(1)(A)(iii). The implementing regulations list "assistive listening devices [and] assistive listening systems" in this category. 28 C.F.R. § 36.303(b)(1). Private clubs or houses of worship are excluded, 42 U.S.C. § 12187 (although many houses of worship are voluntarily taking steps otherwise mandated under the Act); and the requirement does not apply if fulfilling it would fundamentally alter the nature of the service being offered or result in an "undue burden." 42 U.S.C. § 12182(b)(1)(A)(iii).

also includes "effective methods of making visually delivered materials available to individuals with visual impairments,"<sup>3/</sup> such as equipment for delivering descriptive audio. While the ADA does not require that any particular auxiliary aid or service be used, in many cases wireless audio devices can provide the most effective (and cost-effective) means for operators of public facilities to respond to the needs of hard-of-hearing and sight-impaired patrons under the ADA.

4. As ADA compliance increases, the pressure on available frequencies for disability services will also increase.<sup>4/</sup> Some kinds of facilities covered by the ADA, such as museums, hospitals, and recreational facilities, typically require several channels apiece when using auditory assistance devices, so as to be able to provide services simultaneously in multiple rooms. In addition, the ADA regulates many kinds of establishments that do not presently make any significant efforts to assist hard-of-

---

<sup>3/</sup> 42 U.S.C. § 12102(1)(B).

<sup>4/</sup> Although physically handicapped people and the institutions that serve them are eligible under the Special Emergency Radio Service ("SERS"), 47 C.F.R. § 90.38, many (if not most) of the SERS frequencies carry restrictions that make them effectively unavailable for aural services and many of the other potential services discussed in this petition. 47 C.F.R. § 90.53. The Commission's recent reallocation of many SERS frequencies to the new Emergency Medical Radio Service is likely to increase demand for the frequencies remaining. See Emergency Medical Radio Service, 8 FCC Rcd 1454 ¶¶ 23-26 & n.69 (1993).



hearing persons, and these too may contribute to the demand for channel space.<sup>5/</sup>

5. To meet this expected demand, to help schools educate hard-of-hearing children, and to help hospitals and other health care facilities cope with a chronic shortage of spectrum for patient telemetry and other short-range communications, Phonic Ear urges the Commission to allocate the 216-217 MHz band for low-power disability services and health care radio services. Phonic Ear's own experience at 72-76 MHz, described below, points up the absolute necessity of restricting this band solely to low-power operations. Another compelling reason for a strict low-power constraint is the threat of interference to adjacent TV channel 13. Although TV broadcasters have strenuously and successfully opposed all past efforts to license the 216-217 MHz band, Phonic Ear believes that the present proposal should and will win their support.

6. Regulatory details appear in Part V, below. In brief, Phonic Ear suggests that eligibility be extended to any educational or health-care facility, any "public accommodation" as defined in the ADA,<sup>6/</sup> and any person with a disability. Permitted uses would include any communication made in the course of educating or providing goods or services to a person with a disability, any communication made by or to a person with a

---

<sup>5/</sup> The list of ADA-covered facilities is reproduced in Appendix A.

<sup>6/</sup> 42 U.S.C. § 12181(7). See Appendix A.

disability in addressing his or her needs, and any communication made by a health care facility for the purpose of treatment, diagnosis, or patient monitoring.<sup>2/</sup> As under the present Part 15 rules, unlicensed transmitters would be permitted to produce up to 200 microvolts/meter at 3 meters. To help minimize and identify possible sources of TV interference, transmitters operating above the Part 15 limits, up to and including a maximum of 100 mW transmitter output power, would be licensed under Part 90 of the Rules. Operation above that level would be prohibited altogether.

## **II. AUDITORY ASSISTANCE DEVICES: A CASE STUDY**

7. Auditory assistance devices are the earliest large-scale application of radio equipment specifically to assist disabled people. Users and manufacturers have now accumulated more than twenty years of experience that may be helpful in planning for other disability services. The most important lesson learned is that good radio engineering is essential, but it is not enough. Equally necessary is a thorough understanding of the physiological, psychological, and even sociological aspects of the particular disability involved.

8. Auditory assistance devices serve hard-of-hearing people in two main kinds of settings. In a typical educational

---

<sup>2/</sup> Under this proposal, communications made by a health care facility in connection with patient care need not have any immediate relevance to a disabled person. As noted below, Phonic Ear believes that this provision will help to maximize spectrum usage in the public interest without threatening the maintenance of a low-power environment.

application, the teacher wears a small microphone and a belt-mounted, battery-powered transmitter; the student wears an earphone connected to a receiver adjusted to match his or her individual audiology. The equipment delivers the teacher's voice directly to the student's ear with a minimum of masking background noise, at whatever sound pressure level the student's impairment requires. The second major application is in public gathering places such as theaters, auditoriums, and houses of worship, where a transmitter connects to the existing audio system and adjustable receivers are made available to hard-of-hearing patrons for the duration of the event.

9. The use of auditory assistance devices in both settings has increased rapidly.<sup>8/</sup> Educators operate under sweeping federal and state mandates requiring hard-of-hearing students (among those with other disabilities) to be taught in the company of their non-disabled peers ("mainstreamed") as much as possible. Where a school once might have concentrated its hard-of-hearing student population in one or two classrooms, today those students are distributed through most of the building, and their auditory assistance devices require a proportionately greater number of channels. At the same time, the public has become more aware and accepting of people with hearing difficulties, and the use of

---

<sup>8/</sup> Phonic Ear estimates that some 70,000 auditory assistance devices are in use in formal educational settings, with another 80,000 used by places of public accommodation and other non-classroom applications.

auditory assistance devices in such settings as theaters and houses of worship is fast becoming commonplace.

10. Even without considering expected growth, the 72-76 MHz band presently used by auditory assistance devices is inadequate.<sup>9/</sup> Recent years have seen a great proliferation of 72-76 MHz private radio systems at permitted power levels up to 300 watts, along with RF links for paging systems at 150 watts.<sup>10/</sup> Classroom auditory assistance devices, which typically operate at only 10 milliwatts transmitter power, are easily overridden by the competing signals.

11. Classroom spot-checks often find children listening to paging or land-mobile transmissions instead of the teacher ten feet away -- completely unacceptable in an educational setting. Language development in young children hinges on their consistently hearing adult speech. Opportunities missed during critical periods in childhood can be made up later only with great difficulty, if at all. The problem of interference is especially pernicious for a profoundly hard-of-hearing child, who

---

<sup>9/</sup> References to the 72-76 MHz band do not include 73.0-74.6 MHz, which is reserved for radioastronomy, and 74.8-75.2 MHz, which serves as a guardband around aeronautical marker beacons at 75.0 MHz. See 47 C.F.R. § 2.106. Only the remaining 2 MHz, just half of the band, is actually available to auditory assistance devices.

<sup>10/</sup> 47 C.F.R. §§ 90.205(b) & 22.501(f). The following private land mobile services are authorized at 72-76 MHz: Police, Fire, Highway Maintenance, Local Government, Forestry-Conservation, Special Emergency, Business, Forest Products, Film and Video Production, Petroleum, Special Industrial, Power, Manufacturers, Relay Press, Railroad, Interurban Passenger, Interurban Property, Urban Passenger, and Urban Property. 47 C.F.R. § 90.555.

may not be able to articulate or explain why he or she cannot understand the teacher. A child with limited auditory experience may not even realize that anything is wrong.

12. Phonic Ear has been able to mitigate the interference problem to some extent by custom-selecting frequencies for each site to minimize local interference. Phonic Ear also maximizes the use of available spectrum by designing its receivers with a sharp out-of-band roll-off, and by using narrow-band equipment wherever practicable. These measures have helped to forestall the inevitable, but they become less effective as high powered transmitters proliferate. In some parts of the country, signals from licensed equipment completely blanket large blocks of the band. Many larger schools lack enough usable frequencies to operate auditory assistance devices in all of their classrooms, even when reusing the same channel in different parts of the building, and are forced to curtail service to hard-of-hearing students. Some school districts have no choice but to defy state and federal requirements for mainstreaming by bussing hard-of-hearing students to remote buildings where there is less radio traffic.<sup>11/</sup>

13. Other problems arise because operation at 72-76 MHz requires a relatively large receiving system. A quarter-wavelength is about one meter, so a reasonably efficient antenna

---

<sup>11/</sup> Although the recent availability of 74.6-74.8 and 75.2-75.4 MHz for auditory assistance devices has helped to alleviate the shortage of spectrum, in some areas the rapidly growing demand for channels has already overtaken these new frequencies.

must be at least several inches long. Receivers in this band are generally about the size of a cigarette pack -- a very young child wears the receiver strapped to his or her chest -- and the earphone cords are used as antennas. But this arrangement cannot be used for children (or adults) who have been fitted with a cochlear implant -- a new and fast-growing technology that uses a microdevice implanted surgically in the inner ear. The implant itself unavoidably generates low-level radio frequency signals that are picked up by the earphone cords and amplified along with the incoming audio, interfering with clear reception. Thus, use of a cochlear implant requires an auditory assistance device that can use a shorter antenna, and hence one that operates at a higher frequency.

14. A large receiver has other drawbacks as well. To many parents, the sight of a box strapped to their child makes the child seem fragile and infirm, and this perception may hinder the parents' all-important task of helping the child to build a sense of confidence and self-acceptance. Later, as students of both sexes enter adolescence, they tend to reject the receivers altogether. At an age when many young people are highly sensitive to their personal appearances and eager to be accepted, the need to wear conspicuous equipment makes hard-of-hearing teenagers feel "different" and isolated from their peers -- a particularly unfortunate result, given that hard-of-hearing young people experience some degree of isolation from society under the best of circumstances. Even among mature adults, an auditory

assistance device can feel like a badge of infirmity. Phonic Ear attempts to minimize these problems by designing receivers intended to resemble personal stereos, but the ruse is only marginally successful. Many teenagers and hard-of-hearing adults still choose to forego the pleasures and benefits of auditory communication rather than brand themselves as disabled.

15. Phonic Ear believes very strongly that disabled people of all ages are entitled not only to whatever direct help technology can provide, but also to the dignity that comes with full acceptance, participation, and respect in society. More than two decades of experience with auditory assistance devices has shown that clear, interference-free reception is necessary, but it is not enough. A device that draws stares from the curious and conspicuously labels the user as "different" cannot fully meet the legitimate needs of the disabled community. Unfortunately, the laws of physics require just this result below about 200 MHz.

### **III. AVAILABILITY OF SPECTRUM WILL PROMOTE ADDITIONAL USES OF LOW-POWER RADIO COMMUNICATIONS TO ASSIST PERSONS WITH DISABILITIES.**

16. Although the use of radio communications to assist persons with disabilities is still in its infancy, two broad categories of applications are apparent, corresponding to carriage of audio and data.

17. Auditory assistance devices are the prototype for many kinds of audio devices, but applications beyond classrooms and public gathering places still remain largely unexplored. In the

home, for example, a transmitter attached to the TV set, radio, or stereo allows a hard-of-hearing person to enjoy entertainment along with the rest of the household.<sup>12/</sup> Depending on the kind and degree of the hearing problem, a microphone-driven transmitter may facilitate communication among family members better than a hearing aid does, much like an auditory assistance device in the classroom. Similar equipment in the workplace, used in a group setting -- around a table, for example -- may reduce the background noise common to conventional hearing aids and enable some hard-of-hearing employees to participate more fully in discussions and decision-making.

18. Phonic Ear has found considerable interest among educators in audio delivery systems for students who, for one reason or another, are unable to focus their attention consistently on a classroom teacher but do not have a measurable hearing loss sufficient to require an individual earphone-based auditory assistance receiver. The problem is often alleviated if the teacher's voice is transmitted via a wireless link to an amplifier which then relays the sound to loudspeakers placed at strategic locations in the room. Such a "free field" audio system seeks to achieve a uniform audio level for the teacher's voice at all locations in the room, rather than a loud, clear voice in the front row and a muffled voice in the back of the classroom. The uniformly distributed sound of the teacher's

---

<sup>12/</sup> Phonic Ear manufactures a product for this use.



voice has been found very helpful in holding the attention of students who previously were unable to follow the lesson.

19. Free field audio systems are beneficial not only for students with attention deficits, but also for those with some types of learning disabilities and with mild levels of hearing loss, which can go undiagnosed for a considerable period of time. Significant levels of hearing loss can be associated with temporary disorders, such as ear infections, leading the child's attention to wander so that he she appears to be less responsive. Use of a free field system often ameliorates such problems. Free field systems are also very helpful for teachers who consistently speak softly or have a mild speech impediment.

20. As noted above, much the same equipment used for auditory assistance can also benefit people with vision problems. Descriptive audio is now provided to the patrons of some theaters, but these often use infrared transmission systems, which are sensitive to the position and orientation of the receiving device and require unimpeded line-of-sight. Low-power radio would give better and more consistent performance. Even so, descriptive audio requires a live, well-rehearsed speaker and is too expensive to offer at every performance of every play. But descriptive audio for a motion picture would be a vanishingly small part of the overall movie budget -- merely a narration on an extra sound track. And, once a movie theater has installed auditory assistance devices to serve hard-of-hearing patrons, the same equipment (on a different frequency) can also deliver the

descriptive-audio sound track to patrons with visual disabilities with no disturbance to others.

21. Even today, multiplex theaters tend to order multi-channel auditory assistance equipment, so that channel space for descriptive audio will often be available. The motion picture industry may well find that providing this service attracts a profitable clientele. Similarly, a TV station broadcasting a descriptive-audio movie could put the extra sound track on an auxiliary audio channel.<sup>13/</sup> A person in the audience with a sight disability would use a low-power radio device at the TV set (similar to an in-home auditory assistance device) to transmit the descriptive audio to an earphone without distracting others in the family. The community of persons with vision difficulties might eventually press for placing descriptive audio on most or all TV programs, just as many TV programs today are routinely captioned for hard-of-hearing viewers.

22. Another principal category of applications, involving data communications, may be particularly helpful to wheelchair users. Personal computers have been a great boon to many physically disabled people because they can "amplify" finger movements into a wide variety of interactions with the environment.<sup>14/</sup> In practice, however, linking a wheelchair-

---

<sup>13/</sup> See 47 C.F.R. § 73.669 (authorizing auxiliary audio channels).

<sup>14/</sup> One well-known user of this technology is the British scientist Stephen Hawking, whose motor abilities are limited to  
(continued...)

mounted keyboard to a desktop computer can be difficult. One approach uses infrared communication, but that requires careful positioning, and it stops working whenever someone passes in front of the wheelchair. A low-power radio link would be far more forgiving and less vulnerable to interruption. Low-power radio is also ideally suited to some forms of computer output -- for example, for relaying synthesized voice from a desktop unit to a wheelchair-bound user.

#### **IV. THE 216-217 MHz BAND IS WELL SUITED TO DISABILITY SERVICE DEVICES.**

23. The 216-217 MHz band has long been vacant. Although it is allocated for coast-to-ship communications in the Automated Marine Telecommunications System ("AMTS"),<sup>15/</sup> the Commission has never authorized use of the frequencies because of concerns about interference to adjacent TV channel 13. AMTS use of the frequencies is now impossible in any event, because the Commission recently reallocated the corresponding AMTS ship-to-coast frequencies to the Interactive Video Data Service, an action that effectively "orphaned" the 216-217 band.<sup>16/</sup> The Commission acknowledged as much in an ongoing proceeding when it

---

<sup>14/</sup> (...continued)

the fingers of one hand. Using a system custom-designed for his particular needs, Hawking not only composes text on a word processor but carries on real-time aural conversations using a speech synthesizer.

<sup>15/</sup> 47 C.F.R. § 80.385(a)(2).

<sup>16/</sup> Interactive Video Data Services, 7 FCC Rcd 1630 (1992).

asked how the spectrum could best be used, taking into account concerns about TV interference and spectrum efficiency.<sup>17/</sup>

24. Phonic Ear respectfully suggests that the Commission can best meet its public interest objectives in the 216-217 MHz band by limiting its use to low power operations for services and education for disabled persons and for health care. This action not only will bring a presently-idle spectrum resource into productive use but will also help one of the nation's largest minorities to join the mainstream of society. A strictly-enforced low-power restriction is critical both to prevent the blanketing interference that plagues the 72-76 MHz band today and to eliminate any threat of interference to reception of TV channel 13. The 216-217 MHz band is ideal for a low-power allotment because it has no domestic high-power incumbents who would have to be relocated. Indeed, low power communications may be the only use of the band that can be relied on not to put an interfering signal on home TV antennas. Low power operations also promote spectrum efficiency by making possible extensive frequency reuse, even at the same site.

25. If history is any guide, TV broadcasting interests are likely to oppose any use of more than minimum power near 216 MHz, just as they have invariably opposed the licensing of AMTS at

---

<sup>17/</sup> Maritime Communications, 7 FCC Rcd 7863, 7868-69 (1992). Phonic Ear has filed a comment in that proceeding, in which Phonic Ear asks the Commission to consider questions relating to 216-217 MHz in a separate docket.

216-218 MHz. But Phonic Ear hopes and believes that the TV interests will support its proposal here.<sup>18/</sup>

26. The 216-217 MHz band is particularly appropriate for disability-related education and other services because the short wavelength at 216-217 MHz permits the manufacture of small, inconspicuous receivers with internal antennas instead of earphone-cord-based antennas. Smaller equipment is more attractive for users in terms of weight and appearance, and thus is likely to be accepted by some people who need it but decline to use it today. And, unlike larger receivers, a smaller, less obvious receiver does not intrude on the parent's perception of a hard-of-hearing child so as to interfere with the child's developing self-esteem.

#### **V. REGULATORY ISSUES**

27. **Eligibility.** Subject to the proposal below on permissible communications, Phonic Ear suggests that eligibility for these frequencies include:

- (a) a "public accommodation" as defined in the ADA;<sup>19/</sup>

---

<sup>18/</sup> Representatives of Phonic Ear have met with the TV industry group with the strongest and most consistent stand against licensing near 216 MHz -- Maximum Service Television, Inc. ("MSTV"). The regulatory discussion below attempts to accommodate some of MSTV's concerns relating to power limits, licensing, frequency selection, limited eligibility, permitted emissions, and channelization.

<sup>19/</sup> 42 U.S.C. § 12181(7). See Appendix A.

(b) a person with a disability, as defined in the ADA;<sup>20/</sup>

(c) an educational facility, whether public or private, including a facility for preschool children or for after-school care;<sup>21/</sup>

(d) a health care facility; and

(e) an entity providing service to any of the above.

28. **Permitted Communications.** Phonic Ear proposes that the Commission permit these frequencies to be used for:

(a) a communication made by or to a person with a disability in the course of addressing his or her needs (e.g., use of an in-home descriptive audio transmitter for television);

(b) a communication made in the course of education of a person with a disability (e.g., linking a wheelchair-mounted keyboard to a desktop school computer, or

---

<sup>20/</sup> "The term 'disability' means, with respect to an individual--

"(A) a physical or mental impairment that substantially limits one or more of the major life activities of such individual;

"(B) a record of having such an impairment; or

"(C) being regarded as having such an impairment."

42 U.S.C. § 12102(2). This definition is considerably broader than that presently used by the Commission to determine eligibility in the Special Emergency Radio Service. 47 C.F.R. § 90.38.

<sup>21/</sup> Although this item and the next are included within the ADA definition of public accommodation, Phonic Ear urges the Commission to list them separately for emphasis.

relaying a teacher's voice to an earphone-equipped student or to a uniform classroom sound distribution system for students with auditory attention problems);

(c) a communication made in the course of providing goods or services to a person with a disability, or in handling inquiries or orders relating to such goods or services; or

(d) a communication made by a health care facility for the purpose of treatment, diagnosis, or patient monitoring (e.g., patient telemetry).

As proposed, communications under this last provision need not always involve a person with severe disability, but would be limited to situations concerning persons with special functional or health needs of one kind or another. Phonic Ear believes that this provision will help to maximize spectrum usage in the public interest while maintaining a "quiet" low-power environment that is both suitable for disability services and inoffensive to TV broadcasters and viewers. This provision (d) is intended to permit only those communications directly related to patient care; it would not include, for example, signals used to page medical personnel.

29. **Frequencies.** To establish an orderly structure in the band and to facilitate broadcasters' identifying possible sources of interference, Phonic Ear suggests that the Commission designate 20 evenly-spaced channels centered on frequencies

starting at 216.025 and ending at 216.975 MHz. Users would be permitted to split channels as needed.

30. Some disability services, including auditory assistance devices, require a relatively large bandwidth. While 25 kHz, 12.5 kHz, or less may be ample for some radio communications services, the below-telephone reproduction quality that typically accompanies such narrow bandwidths is insufficient for auditory assistance devices, which require far higher fidelity to achieve their purposes. Phonic Ear's products, for example, typically reproduce audio frequencies up to about 10 kHz -- necessary in the classroom for accurate reproduction of sibilant sounds such as "s" and "sh," and in public gathering places for satisfactory delivery of both music and voice. For similar reasons relating to both language development and reproduction of music, the signal-to-noise ratio in auditory assistance devices must be at least about 60 dB, far in excess of most other radio communications services. Both of these considerations are important factors in the required bandwidth. For other applications such as low-speed data transmission, however, users would be free to split the assigned channels into narrower bandwidths without further Commission action.

31. **Licensing and Power Limits.** Phonic Ear proposes that transmitters producing up to 200 microvolts/meter at 3 meters be regulated as unlicensed devices, as presently provided under the



Part 15 rules.<sup>22/</sup> Phonic Ear further proposes that transmitters operating at higher powers, up to and including 100 mW transmitter power, be licensed under Part 90 of the Rules. Operation above that level should be prohibited altogether. The licensing requirement acknowledges that transmitters operating above the Part 15 limits are more likely to act as sources of TV interference (although the actual likelihood of such interference is very low, under the limits suggested here). All licenses would be non-exclusive. In view of the low maximum power and large numbers of units expected to be in service, applications would not be subject to frequency coordination.<sup>23/</sup>

32. **Station Identification.** Whether manual or automatic, station identification would be highly disruptive to users of auditory assistance devices and descriptive audio transmitters, and most likely other classes of devices as well. Accordingly, Phonic Ear proposes that Section 90.425 be amended to exempt 216-217 MHz from station identification requirements.

33. **Emissions.** Phonic Ear proposes that the Commission authorize FM transmission in the 216-217 MHz band, the most readily available and effective form of modulation today, and restrict other kinds of modulation to emissions which are compatible with analog FM and do not cause more interference,

---

<sup>22/</sup> 47 C.F.R. § 15.209.

<sup>23/</sup> The Commission's Rules already provide that applications at 216-220 MHz are exempt from frequency coordination. 47 C.F.R. § 90.175(f)(13).